

What is claimed is:

1. A cap for a filter, comprising:
  - an interior filter-contacting surface adapted to frictionally engage an outer surface of the filter; and
- 5                   an exterior gripping surface, opposed to the interior filter-contacting surface, the exterior gripping surface having an average surface roughness ranging between about 0.025 millimeters (0.00098 inches) to about 4.57 millimeters (0.18 inches) (peak to valley).
- 10                 2. The cap as defined in claim 1 wherein the filter is a spin-on filter having a gasket-receiving end region and an end region distal to the gasket-receiving end region, and wherein the cap is adapted for use on the spin-on filter.
- 15                 3. The cap as defined in claim 2 wherein the interior filter-contacting surface aligns over at least a portion of the distal end region.
- 20                 4. The cap as defined in claim 1 wherein the filter is a spin-on filter having a gasket-receiving end region and an end region distal to the gasket-receiving end region, and wherein the cap is adapted to be disposed on the filter outer surface at an area intermediate the gasket-receiving end region and the distal end region.
- 25                 5. The cap as defined in claim 1 wherein the cap is pre-formed.
6. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 0.51 millimeters (0.02 inches) and about 4.57 millimeters (0.18 inches).

7. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 0.76 millimeters (0.03 inches) and about 3.048 millimeters (0.12 inches).

5 8. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 1.016 millimeters (0.04 inches) and about 2.29 millimeters (0.09 inches).

10 9. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 0.025 millimeters (0.00098 inches) and about 1.14 millimeters (0.045 inches).

15 10. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 0.13 millimeters (0.005 inches) and about 0.76 millimeters (0.03 inches).

11. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) ranges between about 0.25 millimeters (0.01 inches) and about 0.38 millimeters (0.015 inches).

20 12. The cap as defined in claim 1 wherein the average surface roughness (peak to valley) is about 1.52 millimeters (0.06 inches).

25 13. The cap as defined in claim 1 wherein each of the peaks is generally a spline-shaped member; and wherein the number of peaks ranges between about 2 and about 96.

14. The cap as defined in claim 1 wherein the cap is formed from a polymeric material.

15. The cap as defined in claim 14 wherein the polymeric material is a thermoplastic material.

16. The cap as defined in claim 15 wherein the polymeric material is  
5 polyvinyl chloride (PVC).

17. The cap as defined in claim 14 wherein the cap is formed from a thermoset material.

10 18. The cap as defined in claim 17 wherein the thermoset material is a rubber material.

19. The cap as defined in claim 1 wherein the cap is adapted for single-use.

15 20. The cap as defined in claim 1 wherein the cap is adapted to be reusable.

20 21. The cap as defined in claim 1 wherein the exterior gripping surface aids in tactile control of the filter during insertion and removal of the filter in an automotive internal combustion engine.

22. The cap as defined in claim 1 wherein the filter is adapted to be manually inserted or removed in an engine.

25 23. The cap as defined in claim 1 wherein the filter is adapted to be automatically inserted or removed in an engine.

24. The cap as defined in claim 1, further comprising an orientation portion adapted to aid in filter orientation with respect to the engine during at least one of insertion and removal of the filter.

5 25. The cap as defined in claim 1 wherein the interior filter-contacting surface is adapted to be substantially bonded to the outer surface of the filter.

26. The cap as defined in claim 1 wherein the cap is adapted to be removable from the outer surface of the filter.

10 27. A cap for a spin-on filter having a gasket-receiving end region and an end region distal to the gasket-receiving end region, the cap comprising:

an interior, filter-contacting surface, wherein the filter-contacting surface is adapted to be received over at least a portion of, and to frictionally engage an outer surface of the distal end region of the filter; and

15 an exterior gripping surface, opposed to the interior filter-contacting surface, the gripping surface having an average surface roughness of about 0.025 millimeters (0.00098 inches) to about 4.57 millimeters (0.18 inches) (peak to valley);

20 wherein the cap is formed from a polymeric material, and wherein the exterior gripping surface aids in tactile control of the filter during at least one of installation and removal of the filter in an automotive internal combustion engine.

25 28. The cap as defined in claim 27 wherein the average surface roughness (peak to valley) ranges between about 0.76 millimeters (0.03 inches) and about 3.048 millimeters (0.12 inches).

29. The cap as defined in claim 27 wherein the average surface roughness (peak to valley) ranges between about 0.13 millimeters (0.005 inches) 30 and about 0.76 millimeters (0.03 inches).

30. The cap as defined in claim 27 wherein each of the peaks is generally a spline-shaped member, and wherein the number of peaks ranges between about 2 and about 96.

5       31. The cap as defined in claim 27, further comprising an orientation portion adapted to aid in filter orientation with respect to the engine during at least one of insertion and removal of the filter.

10      32. A spin-on filter, comprising:

an outer surface; and

a cap, comprising:

an interior, filter-contacting surface adapted to frictionally engage the outer surface of the filter; and

15      an exterior gripping surface, opposed to the interior filter-contacting surface, the gripping surface having an average surface roughness ranging between about 0.025 millimeters (0.00098 inches) and about 4.57 millimeters (0.18 inches) (peak to valley).